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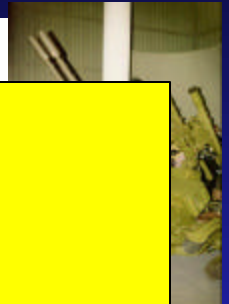
# Time Critical Counter Targeting ACTD Candidate





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# The Problem



## Common Characteristics

- Highly mobile
- Shelter/Hide site to firing position in minutes
- Movement begins to hide site seconds after firing
- Often fire from defilade or under cammo netting
- Increasing use of cabled communications to defeat SIGINT based identification and localization

**BUT**

***They all emit flame when they fire....***



**Mortars**



**IADS/SAMs**



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See the tanks firing across the park?



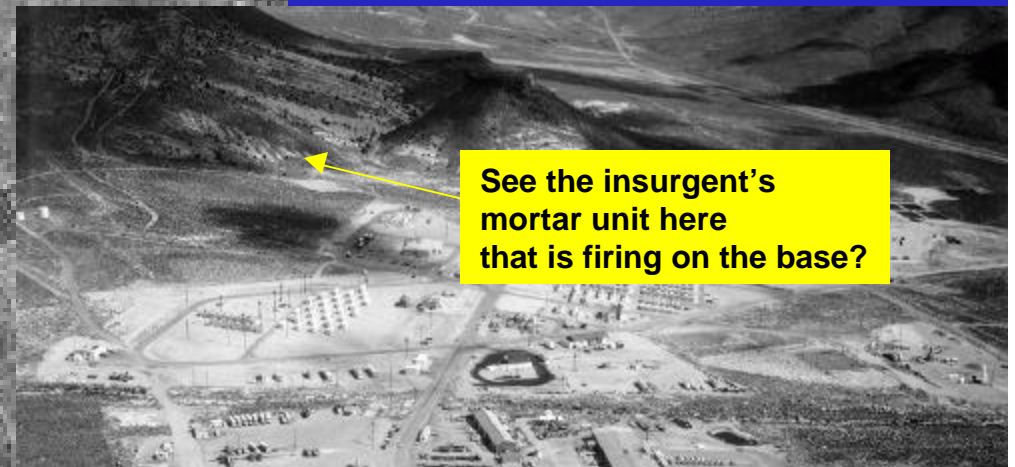
See the 6 gun 152mm artillery unit here in the woods?

See the SA12 SAM here retreating under camouflage netting?



See the six 220mm MRLs that are set up and firing outside their tunnels?

See the SS21 TEL moving back to its hide site?



See the insurgent's mortar unit here that is firing on the base?

***Of course you can't! But this is what TACAIR pilots can't see either!***



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# Military Need

- ◆ Theater CINCs have a critical need for the capability to detect, neutralize and destroy time critical mobile targets throughout the theater and especially in USFK
  - Defeat relocatable targets
  - Defeat brief exposure mobile targets
  - Defeat integrated (networked) air defense systems
  - Defeat moving targets
  - Defeat targets protected by caves/fortifications
  - Defeat insurgent fire into vital areas
  - Defeat camouflaged targets

*And the capability needs to be.....*

*Easily deployable and have a small logistics footprint*





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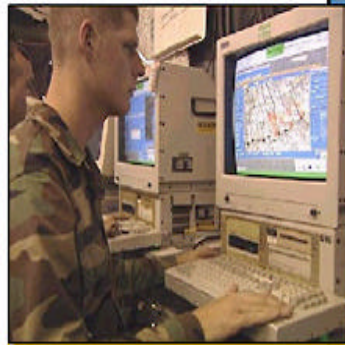
# TCCT Concept of Operations

1. F-18 mounted wide coverage IR detector (BOA) sees a "flash event".

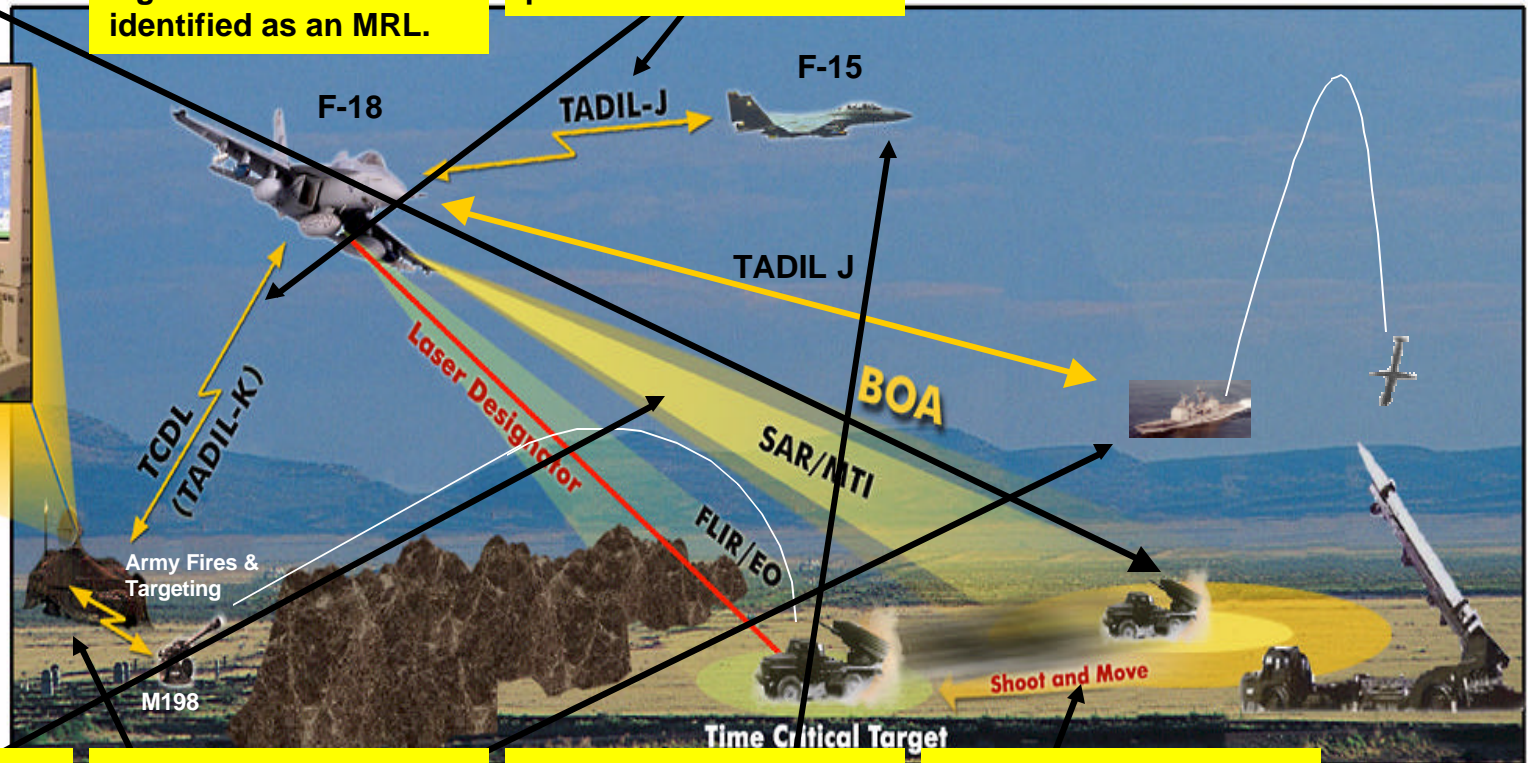
2. BOA processor matches "flash event" against a MASINT data base of flash signatures. Flash identified as an MRL.

3. TADIL J/K msg of MRL detection sent. SAR/EO spot beam slaved to contact position.

4. SAR/EO confirms ID of contact as MRL. TADIL J/K update messages sent.



Common  
Operational  
Picture



5. GMTI begins tracking of target as it moves to hide site. TADIL J/K update messages sent.

6. Army and Navy fires and targeting systems process the counter fire target for processing by artillery or missile attack.

7. Alternatively, target coordinates are processed by other airborne strike assets for attack.

8. SAR/EO used to perform BDA of target after completion of counter fire event.



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# F/A-18 TCCT Sensor Suite



## ATFLIR Pod

w/BOA Mod

- Day/night
- All weather
- Medium Altitude
- 417 lbs
- 13" x 72"
- EO/IR/Laser Designator
- BOA processor

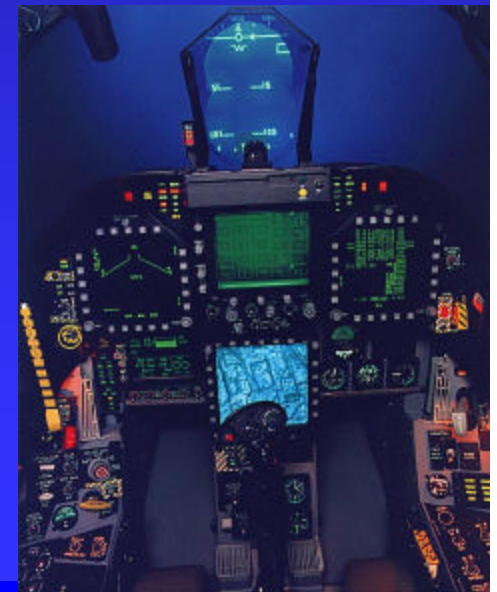
## Advanced Display

- In Cockpit SAR/GMTI Display

## F-18E/F APG-73 Radar



- Day/night
- All weather
- Medium Altitude
- Overflight/Standoff
- High Altitude Standoff
- SAR/GMTI
- AESA Upgrades Planned
  - Higher SAR resolution
- TADIL J/K Target Reports
  - Air to air
  - Air to ground
- NFN Compatible
- Army/USMC Fires & Targeting Compatible
  - ADOCS/LAWS
  - AFATDS





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# TCCT's Impact on the Time Critical Strike (TCS) "Kill Chain"

- TCCT is the counter-battery portion of TCS
- TCCT CONOPs is characterized by same "Kill Chain" Functions performed for TCS
  - Detect
  - Decide
  - Engage
  - Assess

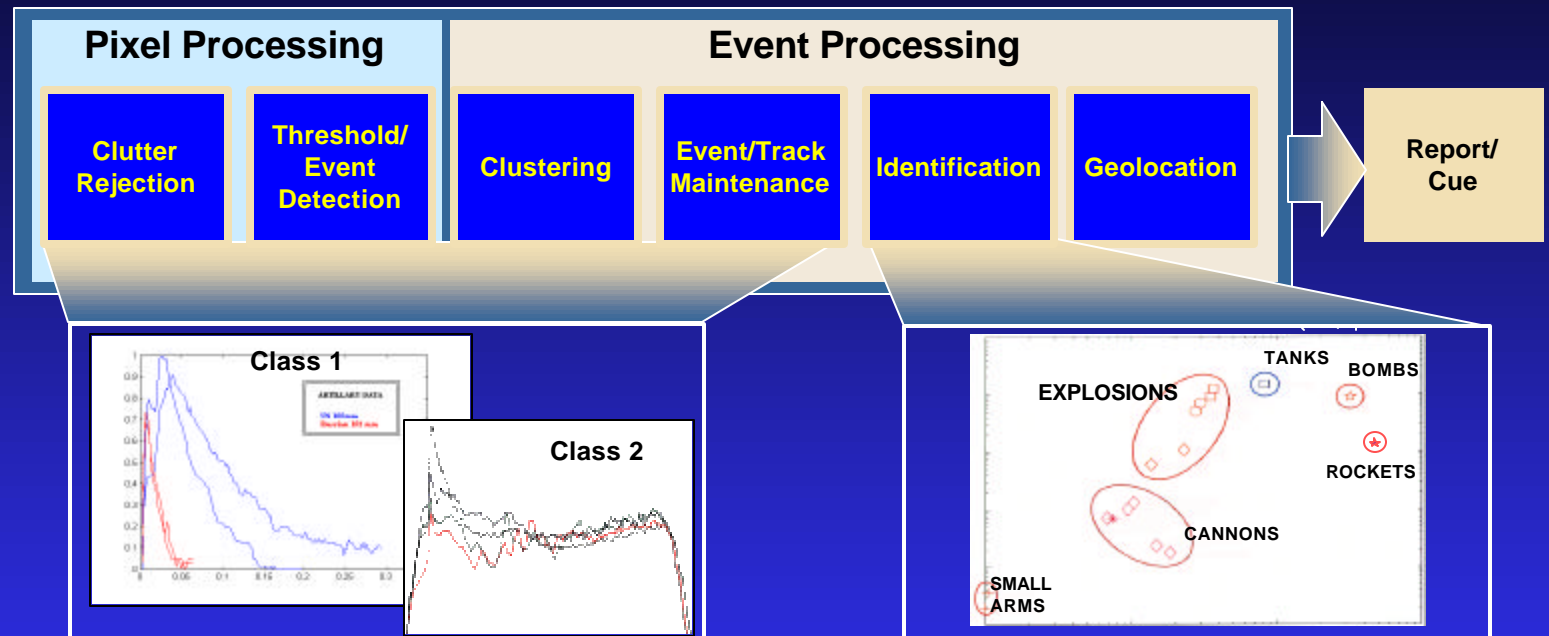
***TCCT will positively impact all of these functions and satisfy ROE constraints***



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# TCCT ACTD Technology

## Battlefield Ordnance Awareness ATD



Target Observation



- **Identification Based on Temporal Intensity Profile**
  - High Frame Rate to Build Profile
  - Features Selected to Improve Identification
- **Two Step Process**
  - Calculation of Statistical Principal Components
  - Application of Bayesian Classifier

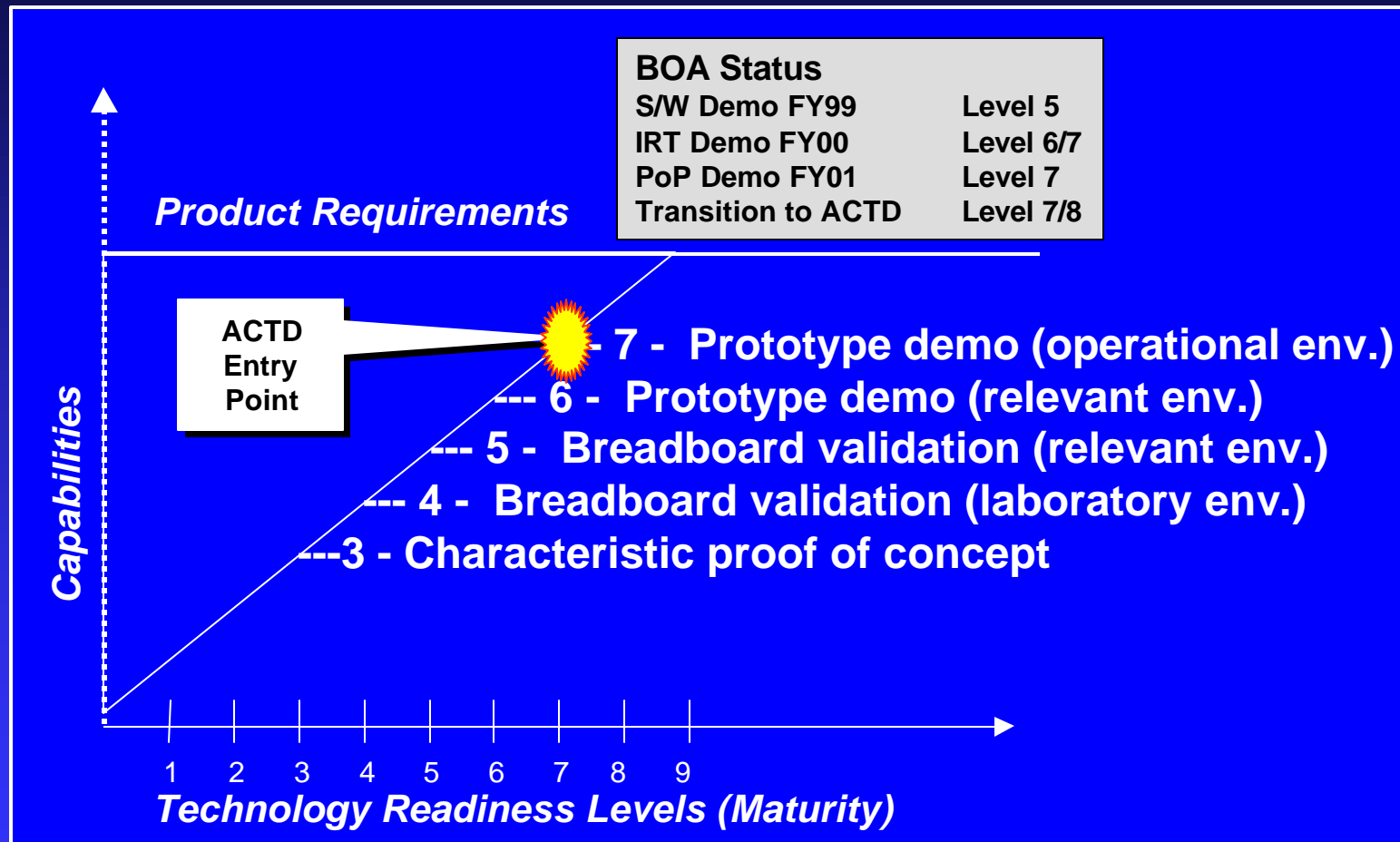
***BOA Provides High Confidence Detection, Identification, and Location in Near Real-Time***





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# Technology Maturity





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# **Time Critical Counter Targeting ACTD**

## **- Participants -**

### **◆ Sponsors**

- User Sponsor -- USCINCPAC**
- Operational Manager – COMSEVENTHFLT**
- Transition Manager – NAVAIR PEO (T) (Proposed)**
- Oversight – Office Of Naval Research (ONR)**

### **◆ Developers**

- Technical Manager – PEO (T) (Proposed)**
- Deputy Technical Manager - SMDC (BOA)**

### **◆ Lead Service: Navy**

### **◆ Supporting Services**

- Army**
- Air Force**



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# Time Critical Counter Targeting ACTD

## - Demonstrations -

**Year 1**

**C-12**

**BOA**

- Classification S/W & Limited System S/W Improvement
- Comm Eqt
  - JTIDS
  - SINCGARS CIP
  - LINX SAR (Not Integrated)

**MSD 1**

- Capability Assessment
  - Comm
  - Baseline Comparison

**Year 2**

**C-12**

**BOA**

- System S/W Upgrades
- Comm
- Integrated BOA & LINX SAR

**MSD 2**

- CONOPS Demo
  - Testbed for F-18 CONOPS
  - Integrated Capability
- TTP development starts

**Year 3**

**F-18**

**BOA**

- New Sensor
- New Processor
- Pod Mods
- SAR & BOA Not Integrated

**MSD 3**

- BOA on Fast Mover
  - Capability Validation

**Year 4**

**F-18**

**BOA**

+

**Pod Mod**

+

**Integrated SAR & Display**

**MSD 4**

- Integrate System Demo
- TTP validation
- JMUA



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# Expanded TCCT ACTD Options

## - Still in Discussion -

**Year 1**

**Year 2**

**Year 3**

**Year 4**

### System Demo 1

- Capability Assessment
  - Comm
  - Baseline Comparison

#### **C-12**

- BOA
- LYNX SAR
- Comm Eqt
- Integration
  - BOA, LYNX Independent

#### **OPTION**

#### **Scathe View**

- BOA
- LYNX SAR
- Comm Equipment
- Integration
  - BOA, LYNX Independent

### System Demo 2

- CONOPS Demo
  - Testbed for F-18 CONOPS
  - Integrated Capability

#### **C-12**

- BOA
- LYNX SAR
- Comm Eqt
- Integration
  - BOA, LYNX Integrated

#### **OPTION**

#### **Predator**

- BOA
- LYNX SAR
- Comm Equipment
- Integration
  - BOA, LYNX Integrated

### System Demo 3

- BOA on Fast Mover
  - Capability Validation

#### **F-18**

- BOA
- SAR
- ATFLIR Pod (Mod)
- Integration
  - BOA, SAR Not Integrated

#### **F-15/F-16**

- BOA
- SAR
- LANTIRN Pod (Mod)
- Integration
  - BOA, SAR Not Integrated

### System Demo 4

- Integrated System Demo

#### **F-18**

- BOA
- SAR
- ATFLIR Pod (Mod)
- Integration
  - BOA, SAR, & Display Integrated

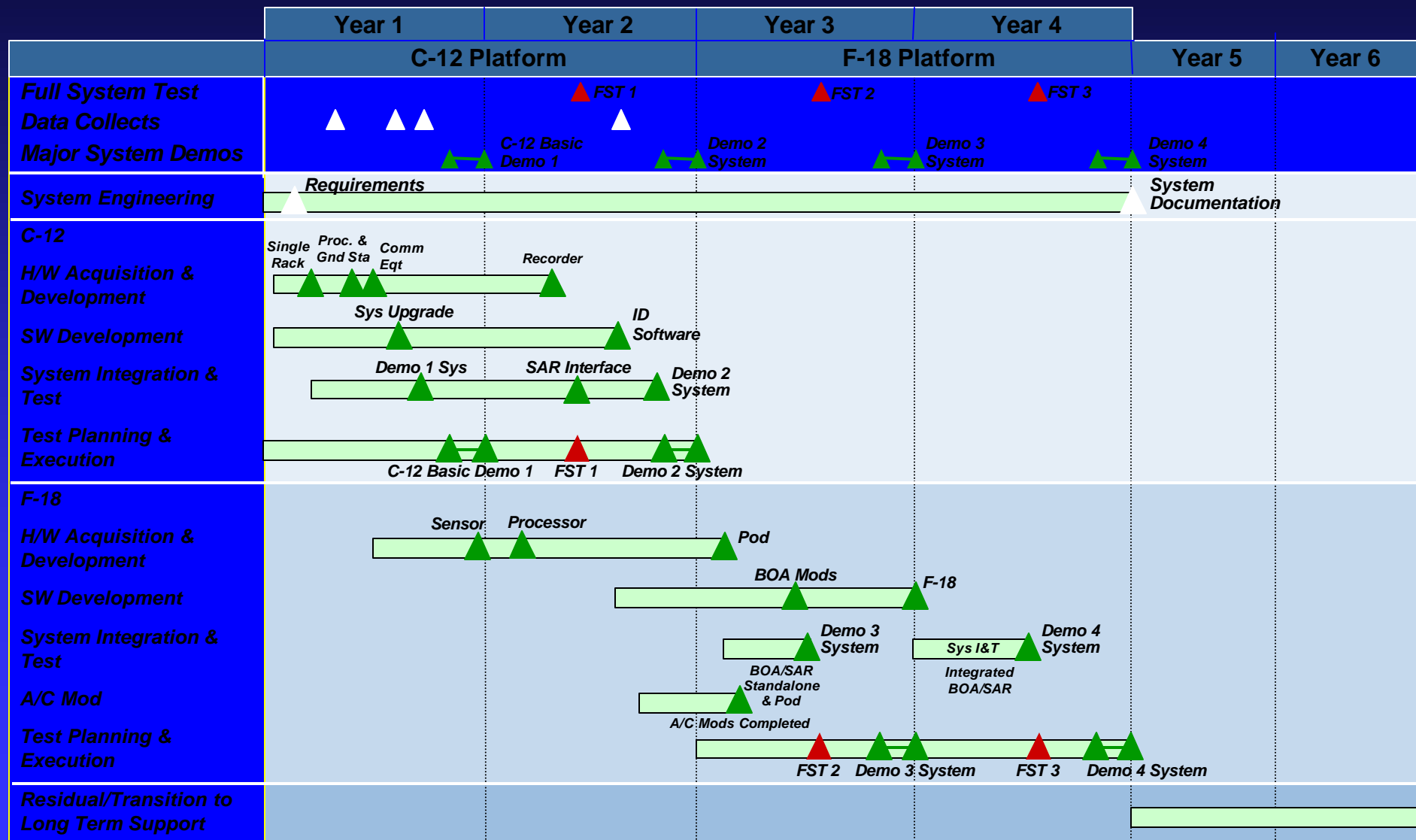
#### **F-15/F-16**

- BOA
- SAR
- LANTIRN Pod (Mod)
- Integration
  - BOA, SAR, & Display Integrated



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# TCCT Schedule







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## Time Critical Counter Targeting ACTD - Funding Requirements -

Task	FY02	FY03	FY04	FY05	FY06	FY07	Total
System Engineering C12	\$782	\$995	\$105	\$0	\$0	\$0	\$1,882
C12 Hardware	\$666	\$1,326	\$0	\$0	\$0	\$0	\$1,992
C12 Software Development/IV&V	\$1,773	\$2,617	\$810	\$0	\$0	\$0	\$5,200
C12 System Integration and Test	\$225	\$349	\$93	\$0	\$0	\$0	\$667
C12 Test plan & execute	\$1,327	\$1,966	\$817	\$0	\$0	\$0	\$4,110
System Engineering F18	\$226	\$772	\$885	\$751	\$92	\$0	\$2,726
F18 Hardware Acq/Dev	\$0	\$514	\$2,921	\$270	\$0	\$0	\$3,705
F18 Software Dev	\$0	\$0	\$609	\$799	\$82	\$0	\$1,490
F18 System Integration and Test	\$0	\$0	\$1,205	\$248	\$0	\$0	\$1,453
F18 Aircraft Mods	\$0	\$0	\$0	\$570	\$0	\$0	\$570
F18 Test Planing/Execution	\$0	\$0	\$1,260	\$2,125	\$1,149	\$0	\$4,534
Transition Residual to Long Term	\$0	\$0	\$0	\$317	\$455	\$305	\$1,077
OM support stf & TDY	\$150	\$300	\$300	\$300	\$213	\$125	\$1,388
TM support stf & TDY	\$225	\$450	\$450	\$450	\$350	\$250	\$2,175
XM support stf & TDY	\$125	\$250	\$250	\$250	\$188	\$125	\$1,188
Total	\$5,499	\$9,539	\$9,705	\$6,080	\$2,528	\$805	\$34,156

**Note: Flight test costs are still TBD**

**USAF participation is still TBD**



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## Time Critical Counter Targeting ACTD - Recommended Funding Allocations -

Service	FY02	FY03	FY04	FY05	FY06	FY07	Total	Share
CMO	\$200	\$200	\$200	\$0	\$0	\$0	\$600	2%
Service A*	\$1,000	\$1,000	\$2,225	\$659	\$603	\$403	\$5,889	17%
Service B*	\$1,000	\$1,000	\$7,280	\$5,422	\$1,926	\$403	\$17,030	50%
OSD	\$3,299	\$7,339	\$0	\$0	\$0	\$0	\$10,638	31%
Total	\$5,499	\$9,539	\$9,705	\$6,080	\$2,528	\$805	\$34,156	100%

**Note: USAF participation would change cost spread and increase total amount**

**Army and Navy participation is not yet authorized**



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## Time Critical Counter Targeting ACTD - Risk -

- ◆ **Technical Risk:** BOA optics and digital stabilization insufficient for fast-mover operations
  - ➡ Mitigation
    - Engineering analysis
  - ➡ Risk Level: Low
  
- ◆ **Schedule Risk:** Delay in ATFLIR pod engineering/testing completion results in schedule slip
  - ➡ Mitigation: Utilize KPP versions of pod for development
  - ➡ Risk Level: Low
  
- ◆ **Funding Risk:** Funds not completely identified
  - ➡ Mitigation:
    - Continue to develop support within Army, Navy, and USAF operational commands
    - OSD being asked to provide a larger share of up front funding
  - ➡ Risk Level: Moderate



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# Endorsements

- ◆ ADM Dennis Blair, USCINCPAC
- ◆ LTG Tom Case, DCINC USCINCPAC
- ◆ VADM Dennis McGinn, OPNAV N7
- ◆ VADM James Metzger, Commander 7th Fleet
- ◆ GEN Paul Kern, SOA ASA RDA
- ◆ MG Green, Commander Army Air Defense Command
- ◆ Mr. Allen Resnick, TRADOC
- ◆ LTG Noonan, DA DCSINT
- ◆ MG Harding, DA Deputy DCSINT
- ◆ COL Royster, DA DCSINT-PO
- ◆ BG Grant, Previous J2 USFK
- ◆ BG Marks, J2 USFK
- ◆ COL Ted Nicholas, CDR 501st MI BDE Commander
- ◆ LTG Anderson, Commander SMDC
- ◆ COL Bill Marvin, Deputy Commander INSCOM
- ◆ COL Sardo, G3 INSCOM
- ◆ Staffers for:
  - Sen Allard Colo -- Sen Shelby AL
  - Sen Sessions AL -- Cong Cramer AL
  - Cong Callahan AL -- Cong Riley AL





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# **Time Critical Counter Targeting ACTD - Residual Assets and Transition Plan -**

## **◆ Residuals**

### **➔ F/A-18**

- SAR**
- BOA – Sensor, Processors, and Software**
- 3rd Gen FLIR**

### **➔ C12**

- LYNX SAR radar**
- BOA – Sensor, Processors, and Software**

## **◆ Transition**

### **➔ Processor Package for F-18E or F-18F ATFLIR**

- Milestone C ready**

### **➔ USAF interest**

- LANTIRN Pod for F15 / F16**
- Predator**





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# Backups

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